

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Class A and B Penetration**

with type designation(s)

GK - Packing System - GK-SPK, GK-RM

Issued to

**Roxtec GmbH
Hamburg, Germany**

is found to comply with

DNV GL rules for classification – Ships**DNV GL class programme DNVGL-CP-0165 – Type approval – Cable and pipe penetrations****DNV GL offshore standards****Application :****Pipe penetration system in Class A-60 Steel Bulkheads and Decks.****For further details see Applications/Limitations on page 3 of this certificate.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2019-09-27**for **DNV GL**This Certificate is valid until **2024-09-26**.DNV GL local station: **Hamburg CMC**Approval Engineer: **Hagen Markus****Olaf Drews
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

GK-SPK System

Pipe penetration system consisting of rectangular shaped frames, compression-wedge seal, standard modular pipe and/or filling modules (green colour), accessories and metal/plastic anchor plates. Module System length is 60mm.

Frame Type ¹	Frame Sizes and types	Fixing Method
SPK	Single and group frames in nominal sizes 2, 4, 6 and 8.	welded
SPK-S30	Chamber width(s) of 60mm and 120mm.	welded
SPK-S50	Frames available in different combinations and back to back arrangement (BTB).	welded
SPK- F, - R	Minimum frame depth of 60mm.	welded + bolted
SPK-BTB	Bolted frames are available in aluminium and steel.	welded
SPK-h	Single frames in nominal sizes 2, 4, 6 and 8 with chamber width(s) of 120mm and 180mm and BTB. Minimum frame depth is 60mm.	welded
Maximum frame size		SPK-8x4

Notes

¹ Empty frame types SPK, SPK-F, SPK-S30, SPK-S50, SPK-F-R intended to be installed in non-watertight bulkhead or decks may be closed by using blank covers of type GK-BD.

Packing Modules - GK-SPK System

Halogen-free (green colour) pipe modules, filling modules and accessories (Standard 3-Rib). GK-SPK-Frames may also be fitted with Roxtec international (blue) modules, compressions system and stay plates, however mixing of GK-components and Roxtec-Modules in one opening is not permitted.

GK-RM System

Pipe and bundle tube penetration system consisting of Circular Sleeves², Round Module type RM (Halogen-free, green colour) with square packing space including compression function and modular pipe and/or filling modules. Module System length is 60mm.

Frame Type	Frame Sizes	Fixing Method
SLRM	Nominal sizes 50, 70, 100, 125, 150 and 200 and back to back arrangement (BTB). Maximum frame size: SLRM 200	welded
SLRM-F		welded + bolted
SLRM-BTB		welded
SLRM-RED	Nominal sizes 50, 70 and 100	welded + bolted

Notes

² Minimum length of 65mm and minimum wall thickness of 4mm.

Application/Limitation

Class A-60 Steel Bulkheads and Decks, general application.

For application on A-0, A-15 and A-30 divisions, the penetration system shall be insulated as approved for class A-60. The penetrated division is to be insulated as for A-60 at least 200 mm around the penetration. Other applications are subject to case-by-case approval.

The insulation material used shall be of approved type.

Each pipe penetration system is to be supplied with its actual manual for installation and use.

Minimum Filling Rate 0%: no pipe installed - all modules are empty.

Maximum Filling Rate 100%: multiple pipes installed - pipe installed in every module.

Penetration systems are generally not to be used for penetrating boundaries of tanks. Approval may be given on a case by case basis. The use in dry void spaces is approved.

Size range of penetration pipes (media pipe)

Pipe material	Outer diameter	Frame types
Carbon, Stainless Steel and Copper	6 - 108mm	Rectangular, Circular
	6 - 51	SLRM-Red
Bundle tubes	max. 29mm	Rectangular

Water - and Gas tightness

GK Packing System	Water Pressure		Gas Pressure (air)	
	Test pressure	Approved pressure	Test pressure	Approved pressure
GK-SPK (with metal stay-plates)	3.8 bar	2.5 bar	0.3 bar	0.2 bar
GK-RM, size 50 up to size 150	3.0 bar	2.0 bar	0.3 bar	0.2 bar
GK-RM, size 200	2.0 bar	1.3 bar	0.3 bar	0.2bar

Water tightness – special cases

The GK Packing System is not tested with regard to the requirements given in SOLAS Ch. II-1 Reg. 13.2.3 (combined fire and water tightness test, 2014 issue).

Refer to DNV GL CP-0165, Sec. 2 - Ch.5.

GK Packing System - Installation

The installation and insulation of the GK-Packing System is to be carried out according to the following manufacturer`s instructions, actual versions apply.

Welding and mounting instructions

Document title
GK Welding Instructions Steel and Aluminium
GK-SPK Mounting Instructions
GK-RM Mounting Instructions

GK Packing System - Installation

Insulation instructions

Drawing Title	Drawing	Transit
Steel Pipe Rectangular A-60 Steel B & D	Z2019005	Rectangular
Steel Pipe Circular A-60 Steel B & D	Z2019006	Circular
Copper Pipe Rectangular A-60 Steel B & D	Z2019007	Rectangular
Copper Pipe Circular A-60 Steel B & D	Z2019008	Circular
Blind Cover BD Rectangular A-60 Steel B & D	Z2019019	Rectangular
Routing Combination Frames A-60 Steel B & D	Z2019030	Rectangular
Routing BTB Frames A-Class Steel B & D	Z2019032	Rectangular / Circular

Marking of product

Scope	Packaging unit – Modules	Frames
	Example	Example
Manufacturer name	Roxtec GmbH	Roxtec GmbH
Type designation	GK Packing System FM-30/00 HF	GK Marine Packing System SPK-S50-6x2/1.0570-Sigmaweld
Fire Rating	A0, A15, A30, A60	A0-A60

Tests carried out

- Fire tests according to IMO Res.MSC.307(88)-(2010 FTP Code)
- IMO MSC.1/Circ.1488
- Pressure tests according to DNV GL CP-0165, Sec. 2 - Ch.4 Water tightness and gas tightness.

Type Approval documentation

Watertightnes and gastightnes test reports

Test report	Date	Test specimen	Drawing
GK 20190815	2019-08-15	C_RM 150_empty_Side A_	GK20190815-18 GK-04-RM150-Kaefig, Rev. B GK-01-Beschlag RM 150 - O, Rev. b
GK 20190516	2019-05-16	B_SPKh-180-8_pipes 6 up to108mm_Side A+B	GK20190516-07
		B_RM200_st pipe 108_Side A+B	GK20190516-05
		B_RM200_pipes 6 up to 54_Side A+B	GK20190516-06
GK 20190606	2019-06-06	A_RM200_empty_Side A	GK20190606-02
		SPKh-180-8_empty_Side A+B	GK20190606-04
		SPK-8x1 (122)_empty_Side A+B	GK20190606-14
		B_SPK-2x1_empty Side A+B	GK20190606-16
GK 20190730	2019-07-30	A_RM-200_empty_Side A	GK20190730-02

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A-60 Fire test reports

Reference DNVGL Fire Test program matrix GK Packing system, 2019-08-27

Test report	Date	Division	Specimen	Material / O.D. mm	Frame types
DMT-DO-53-103	2019-02-27	Bulkhead	A	Steel / 20	SLRM-RED-50 (non-exposed)
			D	Steel / 51	SLRM-RED-100 (non-exposed)
			I	Copper / 22	SLRM-RED-50 (exposed)
			B	Steel / 108, 51	SPKh-180-8
DMT-DO-53-104	2019-02-26	Bulkhead	C	Bundle tube / 10, 29	SPK-8+8x6
DMT-DO-53-110	2019-03-27	Bulkhead	A	Cu / 8, 12, 28, 54	SPKh-180-8
			D	Cu / 108	SPKh-180-8
DMT-DO-53-111	2019-03-27	Bulkhead	D	Cu / 8, Steel / 8	SPK-60-2x1
			B	Cu / 42	SLRM-RED 100 (exposed)
			C	Cu / 108	RM-200
			E	Cu / 28	RM-70
DMT-DO-53-112	2019-05-22	Bulkhead	B	Cu / 54, Steel / 51	RM-200
			C	Steel / 108	RM-200
			A	No pipes	RM-50
			E	No pipes	SPK-60-2x1
RS-19/B017/E	2019-05-27	Bulkhead	C	CU / 8, Steel / 8	SLRM-50
GV05/4237.1	2005-04-28	Bulkhead	B21 2005 03	CU / 42	SLRM-100
GV 09/6415 GV 09/6416 GV 09/6557	2009-02-13 2009-03-04 2009-04-29	Bulkhead	# 24 # 26 # 28	Blind cover	SPK-S50-8x1 SPK-S50-8+8x3 SPK 2x1
N141UMGR	2019-07-16	Bulkhead	A	Cu / 8, 22, Steel / 8, 20	SPK-S50-8x4
RS-19/B018/E	2019-06-17	Deck	A	Cu / 42	SLRM-RED-100 (exposed)
			K	Steel / 50	
			E	Cu / 2x8 Steel / 2x8	SPK-60-2
			C	Cu / 2x54 Steel / 2x50	RM-200
			H	Steel / 108	
			J	Cu / 2x8 Steel / 2x8	RM-50
RS-19/B-019/E	2019-05-27	Deck	E	Bundle tube / 10, 29	SPK-8+8x6
RS-19/B-225/E	2019-08-01	Deck	A	Steel / 10, 54, 23	SLRM-200
			D	Steel / 108	SPK-h-180-8
			M	Steel / 6, 10	RM-70
N141TXUX	2019-07-05	Deck	A	Cu / 22, 108	SPK-h-180-8
			C	Cu / 108	RM-200
N141UMHA	2019-07-16	Deck	A	Blind cover	SPK S50-8x1
			B	Cu / 8, 22 Steel / 8, 20	SPK S50-8x4
			D	Blind cover	SPK S50-4

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Steel Pipe Circular A-60 Steel B & D	Z2019006, Rev. A	Circular
Copper Pipe Rectangular A-60 Steel B & D	Z2019007, Rev. A	Rectangular
Copper Pipe Circular A-60 Steel B & D	Z2019008, Rev. A	Circular
Blind Cover BD Rectangular A-60 Steel B & D	Z2019019, Rev. A	Rectangular
Routing Combination Frames A-60 Steel B & D	Z2019030, Rev. A	Rectangular
Routing BTB Frames A-Class Steel B & D	Z2019032, Rev. A	Rectangular / Circular

GK Packing System - Installation instructions

GK Welding Instructions Steel and Aluminium, September 2019
GK-SPK Mounting Instructions, August 2019
GK-RM Mounting Instructions, February 2016

Miscellaneous documents

- Drawing GK-SLRM-RED-50 (screwed), 2019-09-17
- GK Flange System Overview single & combination frames GK20190611-01, 2019-06-11
- SPK-F Einzelrahmen / Single frame – GK 01-05-120-01-060-0037-SO
- MED Audit report of Roxtec GmbH, Hamburg dated 2019-06-18

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.

End of certificate